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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
SHINGLETON, MICHAEL B	

ART UNIT	PAPER NUMBER
2817	

DATE MAILED: 10/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/600,043	CHOI ET AL.	
	Examiner	Art Unit	
	Michael B. Shingleton	2817	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2 and 5-12* is/are rejected.

7)☒ Claim(s) *3, 4, 13* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Note page 2 of the specification. Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.121(d)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the embodiment as set forth in claims like claim 1 wherein "the gate of the second transistor coupled to the gate of the fifth transistor" while the gate of the fifth transistor coupled to the gate of the third transistor via the fourth resistor must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

Claim 4 is objected to because of the following informalities: Claim 4 is dependent upon claim 2, however, claim 2 does not provide proper antecedent basis for "the PMOS and NMOS inverter branches". It is clearly apparent to the examiner that since claim 3 does provide proper antecedent basis for this

terminology that applicant clearly made a typographical mistake and actually meant claim 4 to be dependent on claim 3 instead. Accordingly, for examining purposes claim 4 will be read as being dependent on claim 3. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 2, 7, 8 and 12 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Afrashteh 5,426,641 (Afrashteh).

Figure 2 of Afrashteh discloses a RF power amplifier system and associated method of operating a RF power amplifier. The conduction angle of the system of Afrashteh is digitally programmed via the microprocessor 210. The associated bias control arrangement that operates the RF amplifier at the conduction angle specified by the digital programming (See the paragraph bridging columns 15 and 16). The control function as noted above form a "digital control function". It is noted that applicant provides no specific definition for this terminology. Note that the system of Afrashteh is for a telephone arrangement wherein clearly an audio, i.e. analog information signal, is generated for transmission via the RF power amplifier (See Figure 1). The above arrangement also provides for a digital control function coupled to the RF power amplifier. However, note Figure 2 of Afrashteh wherein the microprocessor is directly connected to the RF power amplifier and thus this also provides for a digital control function coupled to the RF power amplifier.

Claims 1, 9 and 10 are rejected under 35 U.S.C. 102(e) as being anticipated by Noll et al. 6,542,037 (Noll).

Figure 2 of Noll clearly shows a broadband power amplifier preferably used in broadband applications such as cable television. Note that this is only one disclosed use and that Noll does exclude other uses. It is well known that the frequency of broadband television clearly lies in the RF frequency range and thus a broadband amplifier is a RF amplifier. The RF signal may not be transmitted via free space but note that the claims are not so limited; RF is well-known to be transmitted down conductive lines. The arrangement of Noll clearly has six transistors and four resistors as well as a driver that is

composed of two driver circuits formed by transistors Q1.1 and Q3.1 respectively. The examiner must give the broadest reasonable interpretation to the claim consistent with the specification See MPEP 904.01:

> 904.01 Analysis of Claims
> The breadth of the claims in the application should always be carefully noted; that is, the examiner should be fully aware of what the claims do not call for, as well as what they do require. During patent examination, the claims are given the broadest reasonable interpretation consistent with the specification. See In re Morris, 127 F.3d 1048, 44 USPQ2d 1023 (Fed. Cir. 1997). See MPEP § 2111 - § 2116.01 for case law pertinent to claim analysis.

For example the terms connected and coupled are broad terms. The term connected allows for intervening elements. In a telephone conservation between two parties the telephone of one party is connected to that of the other even though other elements are in between like switching gear, etc.. The term coupled is actually broader than the term connected for things can be coupled without them being actually connected. Furthermore applicant has not defined these terms to mean directly connected and the disclosure of applicant clearly allows for elements to be in between the two elements that are coupled or connected. Thus the examiner has given the broadest reasonable interpretation to the claims consistent with the specification. Furthermore, applicant has not given a specific definition to self-biased. A source voltage source that applies power to the source/drain of the transistors and the bias to these transistors would be a narrow interpretation that Noll clearly meets. Note the voltage source called DC bias that provides the source voltage to the source and drains of the transistors and the bias through voltage divider networks like the voltage divider network formed by at least resistor 508 in one embodiment of the invention. Thus Noll is every much self-biased as applicant's invention. In Figure 2 of Noll while Noll does not label the source and drains of the transistors since the source is connected to the drain and the drain connected to the source the elements described below are in fact connected given the broadest reasonable interpretation of this term coupled/connected. Note that transistor Q1.2 forms the first transistor that has a drain coupled to the sources of the second and third transistors Q2.1 and Q2.2 respectfully. Note that the drain of the first transistor is connected to the source of the third transistor either through elements like R34 or Q2.1. Also note that the drain of the first transistor is connected to the source of the second transistor through elements like C12 and the gate capacitance of the second transistor or through elements like R34 and the third transistor. The drain of the second transistor is connected to the gate of the second transistor via a first resistor R34 as is clearly illustrated. The gate of the second transistor is coupled to the gate of the fifth transistor Q4.1 via a second resistor R33. The drain of the fourth transistor Q3.2 is coupled to the sources of the fifth transistor and the sixth transistor Q4.2 via paths that include elements like R32 as is clearly illustrated. Due to the symmetry in the circuit

of Noll these paths are very similar. However, note that the drain of the fourth transistor is connected to the source of the sixth transistor either through elements like R34 or Q4.1. Also note that the drain of the fourth transistor is connected to the source of the fifth transistor through elements like C13 and the gate capacitance of the fifth transistor or through elements like R32 and the sixth transistor. The drain of the fifth transistor is coupled to the gate of the fifth transistor via the third resistor R32 as is clearly illustrated. The gate of the fifth transistor is coupled to the gate of the third transistor via the fourth resistor R41 and includes in the connection path at least R32 and R43. Accordingly, it follows that the fourth resistor is coupled to the gate of the third transistor (Note the above that recites the fourth resistor coupled between the fifth and third transistors.). Similarly, the second resistor R33 is clearly coupled to the gate of the sixth via the path that includes at least the capacitance of the fifth and sixth transistors. As noted above Q1.1 and Q3.1 are two driver stages that clearly are coupled to the self-biased cascode stage(s). The gate of the first transistor is coupled to the driver stage composed of at least element Q1.1 via the capacitance of element Q1.2.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Afrashteh 5,426,641 (Afrashteh) in view of Sowlati US2002/0196086 (Sowlati).

Afrashteh as applied above in the rejection of claim 2, 7 and 12 and the following: Afrashteh is silent on the details of the RF power amplifier.

Self-biased cascode stage amplifiers are conventional in the art for use as RF power amplifiers. Sowlati shows various cascode stage self-biased power amplifiers in Figures 3a-c, 4a-b, 5a-b and Figure 6. Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have replaced the RF power amplifier of Afrashteh with a self-biased cascode stage RF power amplifier because, as the Afrashteh reference is silent on the exact RF power amplifier stage employed one of ordinary skill in the art would have been motivated to use any art-recognized equivalent RF power amplifier stage therefore such as the conventional self-biased cascode stage RF power amplifier as shown by Sowlati.

Afrashteh is also silent on the employment of a driver stage prior to the RF power amplifier stage. This is common-place in the art so as to allow for signals of "smaller" magnitude to power the RF power amplifier.

Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ a driver stage prior to the RF power amplifier stage so as to allow signals smaller than could power the RF amplifier by themselves to power the RF power amplifier as is conventionally known in the art.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Noll et al. 6,542,037 (Noll) as evidenced by Millman.

The same reasoning as applied in the above rejection of claims 1, 9 and 10 and the following: Noll is silent on calling the driver stage an inverter-type class amplifier. Millman in Figure 8-14 (c) clearly shows that this type of arrangement is an inverter-type class amplifier. Thus Noll is seen as meeting this limitation. Noll is silent on the biasing point or conduction angle point of this amplifier such that class B operation is obtained. The class of operation is dependent on the biasing point and clearly the biasing point is merely part of the optimum or workable range. The value of the resistor R51 for example is a result effective variable. As the choice of result effective variables involves routine skill in the art it would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected the value of the result effective variables i.e. resistors to any value that results in the operation of the device of Noll to be within the optimum or workable range such as class B operation.

Claims 3, 4 and 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Sowlati "Bias boosting technique for a 1.9 GHz class AB RF amplifier" discloses the general state of the art concerning biasing of the amplifiers. Ito JP362287704 discloses various cascode amplifiers. In particular note Figure 5.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael B. Shingleton whose telephone number is (571) 272-1770. The examiner can normally be reached on Tues-Fri from 8:30 to 4:30. The examiner can also be reached on alternate Mondays. The examiner normally has the second Mondays of the bi-week off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Pascal, can be reached on (571)272-1769. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MBS
September 23, 2004

MICHAEL B. SHINGLETON
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GROUP ART UNIT 2817